Michigan House NRTOR Committee Hearing - St. Marys River Water Quality
September 23, 2011
Lake Superior State University

Testimony – Don Elliott, P. Eng, Director of Engineering Services, City of Sault Ste. Marie, Ontario.

I was invited by State Representative Foster's office to provide testimony at today's hearing. Under the advisement of senior staff and corporate counsel, I chose not to attend. After seven years of efforts to convey the truth at public meetings, symposiums and Bi-national Public Advisory Committee (BPAC) meetings with apparently little success, a written testimony is provided instead.

My expertise in this matter is based on 25 years as a professional engineer working in various capacities in the field of municipal engineering. My involvement with the East End Plant is the administration of the operations contract. Operation of the plant is contracted to PUC Services Inc. My comments related to past studies in the river are anecdotal only, and should be corroborated with the agencies who performed the studies.

For the purposes of getting the whole picture, this committee should seek testimony from Canadian officials such as Algoma Public Health, Ontario Ministry of the Environment and Environment Canada. The Committee is also invited to tour the facility at a mutually convenient time. While many of our Michigan friends involved in this issue have visited the plant, it has been an exercise in considerable frustration through the years, trying to convince some individuals to actually see the facility.

Recently, Larry Schrader, Chair of the Sugar Island Monitoring Solutions Committee has written many officials in both countries but he did not contact the City of Sault, Ontario. In an e-mail to Christine Daley of the Chippewa County Health Department (CCHD), I suggested Christine give Larry my contact information so a plant tour could be scheduled. It would be most beneficial to meet with Mr. Schrader to help correct the erroneous content of his letters to agencies and the media. Larry has now contacted me and a plant tour is being scheduled. Having been given copies of several of his letters, the following testimony is essentially responses to his questions. I chose to respond to his letter to BPAC dated August 30, 2011, which seems to ask most of his questions.

Paragraph 1: This paragraph erroneously states that a Canadian newspaper claimed "checkmate" in a "war of words" over a "border dispute", when in fact the article described the situation as a "stalemate". There is a big difference in meaning.

Paragraph 2: This paragraph describes photographs of "toilet trash" and a debris plume in the north channel on July 18, 2011. Much of the photographed material appears to be litter, but I as have stated in a recent e-mail, the sewage related debris dipped from the plume on the 18th was likely from the East End Plant. It has the appearance of having been through a gravity and pumped collection system which is typical upstream of a wastewater treatment plant. It would have been in a 3,949 cubic meter (about 1 million usg) secondary by-pass which was less than 6% of the 70,186 cubic meters (18 million usg) flow that day.

I understand the July 18th material in the photo was dipped from a boat in Canadian waters, not found on the beaches of Sugar Island. The debris plume depicted by a shaded polygon on his sketch appears to hug the north shore which confirms past studies of surface current tracking by other agencies. That type of discharge is rare. The event was related to a

secondary by-pass and the use of the coarse screen at the plant due to a combination of high flows and one of the two duty screens not operating at full efficiency as a result of a mechanical failure. Occasional discharges of floating debris, while rare, are normal and unavoidable at all wastewater treatment plants, including both of our plants, and the Sault, Michigan plant.

High e-coli counts on the opposite shore cannot be summarily assigned to a bypass at the plant, as is done in this paragraph. The evidence is overwhelming from testing by the Sugar Island Monitoring Workgroup and others, that high e-coli counts occur in many locations after a rain event. The evidence throughout the five years of testing is that high e-coli counts are found near both shores, not midstream. The USEPA and MDNRE's own report on e-coli testing in 2010 summarizes many e-coli exceedances in the area and lists potential contamination sources as combined sewer overflows from Sault Michigan, agricultural runoff, urban wildlife, failing or improperly designed septic systems, wastewater treatment plant discharges and stormwater.

Paragraph 3. Mr. Schrader claims the plant is the source of the debris, not storm sewer outfalls. That is incorrect. Storm sewer runoff is the most common source of floating litter. Contrary to what is asserted in this paragraph, the vast majority of by-passes are caused by rainfall and runoff events. From an engineering perspective, it is the intensity of the rainfall that is most important, not the depth of precipitation. How quickly did the rain come? For example, one inch of rain in 24 hours may not trigger a by-pass, whereas ½ an inch in 20 minutes may. What matters is how fast the rate of flow is into the plant. This is true for any plant.

The vast majority of plant by-passes are secondary only, where a small portion of the flow by-passes our bioreactor and secondary settling. Under a secondary by-pass, all flow goes though screening to 1/8 inch, degritting, primary settling and ultraviolet (UV) disinfection. Several tests on effluent under secondary by-pass conditions have shown the effluent is in compliance with the Certificate of Approval issued by the Ontario Ministry of the Environment. The quality of effluent under the vast majority of secondary bypasses is actually very good.

Paragraph 4: Mr. Schrader claims partial treatment is not possible. This is false. On the contrary, it is not possible to discharge raw sewage from this plant. Screening is partial treatment. Primary settling is partial treatment. UV disinfection is partial treatment. A blended bypass is a combination of flows that have been fully and partially treated. How can Mr. Schrader claim otherwise? In order for untreated sewage to be released, it would have to be flowing out the doors of the inlet building, down through the parking lot and grassed area and into the river. Even then some debris would be screened out by overland flow.

Mr. Schrader states that Ultraviolet Light Irradiation is not an effective choice of disinfection because it only works in clear water. On the contrary, UV light disinfection is an industry standard. It eliminates the use of a dangerous gas on site, and the discharge of even small levels of chlorine and chloramines into the river. It may come as a surprise to Mr. Schrader that plant effluent is clear water. It has been the City's experience that even plant influent is surprisingly clear to the uninformed. The plant's UV system measures the UV light transmissivity through the water upstream of the bulbs. The intensity of the light is automatically lowered when the water is very clear, and raised when the water is turbid under high flow or snow melt events. UV light deactivates, or disrupts the DNA of the bacteria rendering it unable to reproduce. The plant limit in the Certificate of Approval is a geometric mean of 200 counts per 100ml. Tests consistently show discharge less than 25 counts per 100ml. That is also the level the old primary plant operated at using chlorine up

until 2006. The average to date in 2011 is 21. The highest single compliance sample result was 240 on August 24th.

Paragraph 5: This paragraph is a list of statements or questions, which I have repeated here in italics:

"We want bio-nutrients reduced..." They have been. Dramatically. The new plant is far more effective at removing harmful components than the old primary plant.

"We want worrisome high e-coli counts from untreated sewage released from the EESP to be at acceptable levels": They are. As stated above, our effluent tests prove it. There is no "untreated sewage" released from the plant. All wastewater is at least partially treated, even under high flow and by-pass conditions. Eleven secondary by-passes have been tested in 2011. Only four exceeded the limit of 200 counts per 100ml. They ranged from 515 to 1690. The result of the e-coli test taken one-half hour into the secondary by-pass on July 18th was 3 counts per 100ml.

"We have requested....timely contact...when by-passes occur". The plant operator is duty bound to report all by-passes to the Ontario Spills Action Centre (SAC). To my knowledge, that is always done. There may be other reporting requirements of PUC Services based on the resolution of the Sugar Island class action lawsuit. The City was not a party to that lawsuit.

"We would like to see sediment reports [presumably river bottom sediments]..." They can likely be obtained from the Ontario Ministry of the Environment and/or Environment Canada, possibly through BPAC.

"It certainly seems that the EESTP could at least filter off the toilet trash that litters our beaches, on both sides of the river." The East End Plant screens to 1/8th inch. Our West End Plant screen size is 1 inch. Screening at the Sault MI plant is in the order of 1 inch. These plants are early 1980's vintage and that was the industry standard of the day. All three plants operate routinely in accordance with their respective designs and certificates of approval/permits. At both of our plants, under extenuating circumstances, some flow is routed through a coarse bar screen (2-inch at East Plant and 1-3/4 inch at West Plant). That is also presumably the case at the Michigan Sault's plant.

"...What is the plan for the City of Sault Ste. Marie, Ontario to separate storm water from sewage [he means sanitary] water." They are separate. They have been for many years. The last few combined manholes were separated in 2003. Sault Michigan is on an accelerated plan to separate it's sewers by 2020. Perhaps that is why Mr. Schrader asks when Sault, Ontario is going to separate it's combined sewers. The answer is that <u>there are no combined sewers in Sault, Ontario</u>. We have repeatedly made this point in press releases and presentations through the seven years this issue has been in the forefront. The additional flow in wet weather events comes from legal foundation drain connections and illegal (post 1968) foundation and roof drains routed to the sanitary sewer. These connections are typical in most cities. There are long term efforts to separate that flow, but it is very difficult to implement and enforce. We call that a "beginning of pipe" solution. Sault, Ontario chose an "end of pipe" solution by building the Sanitary Sewer Overflow (SSO) tank at Bellevue Park. It assists in reducing the frequency and magnitude of overflows and plant by-passes to the river by temporarily storing a portion of the wet weather flow. When flows to the plant subside, the tank is pumped back into the collection system and the contents are properly treated.

Is "*the EESTP ...working at or near capacity, or.... has adequate capacity for surges...*" No, the East End Plant is not operating at it's full capacity. It can receive more flow from additional development in the City. Wastewater treatment plants are not designed to treat all water under high flow conditions. They employ biological processes for treatment. If a plant is designed for a very few high flow days, it would be extremely costly, and it would not treat the effluent effectively for the other 350 or so days of normal flow. That is not practical nor is it cost effective design. They are designed for normal daily flow, with by-pass facilities and/or upstream storage for the high flow events. If there are other long term improvements that can be implemented, we will consider them and budget for them in due course.

Paragraph 6: "*We do not have an effective...treatment plant in Sault Ste. Marie, Ontario*". This statement is false. We do have an effective treatment plant, especially given our $54M upgrade. It operates as designed, and in compliance with it's certificate of approval.

"*No Body Contact Advisories*": These notices persist on both sides of the border due to high bacteria test results, upstream and downstream of treatment plants on both sides of the St. Marys River. They occurred before the plant upgrade, and they occur now. The East End Plant never was the sole source of the problem. The beach closures are our annual vindication against those accusations.

Wastewater plants are only one of many sources of bacteria. There was an article in the Soo Evening News on August 23rd lamenting the beach closures on the Michigan side - including Sherman Park and Brimley up in Lake Superior. Algoma Public Health also closes beaches on occasion, including Mark's Bay upstream of the locks, and the Harmony/Haviland beaches 30 miles up the north shore of Superior. E-coli bacteria are extraordinarily common in stormwater runoff from creeks and storm sewers.

Concluding Comments:

In conclusion, there is no wastewater treatment plant that is 100% foolproof. Both of our plants by-pass partially treated sewage, as does the Sault MI plant. There will always be extreme conditions where a discharge will occur, usually due to high flows and/or mechanical failure. They are necessarily designed to overflow in extreme conditions to prevent plant and upstream flooding.

Other sources include some small quantity, minor overflows in our downtown core in high flow events, and the SSO tank at Bellevue Park has overflowed twice since commissioning in 2003. I expect the Michigan Sault plant by-passes and CSO discharges likely all flow down the south channel. Over the decades, dredging of the shipping channel has diverted the majority of the river flow down the south channel, so discharges from the Michigan Sault benefit from a higher ratio of dilution. If Michigan officials are content that all sewage disposal systems on Sugar Island do not overflow, then you are left with stormwater outfalls/litter as the most common source. Much of the litter in the north channel would be Canadian given the urban nature of the land use compared to the rural land use on the island. That should not be a surprise.

The City remains firm that the East End Plant is not the sole source of the beach closures or litter on the north shore of Sugar Island. A tour can be arranged at the plant for individuals who want the facts.